

**CLAIMS:**

1. A method of analysing a heart beat signal which  
5 comprises a series of heart beat complexes, the  
method comprising the steps of:  
selecting a set of said complexes;  
identifying from the set a subset of complexes each  
of which satisfy a similarity criterion with respect  
10 to members of the set;  
calculating a representative complex from the members  
of the subset; and  
establishing one or more heart beat signal parameters  
from said representative complex.  
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2. The method of claim 1 wherein said step of  
identifying comprises identifying from the set a  
subset of complexes each of which satisfy a  
similarity criterion with respect to an average of  
20 the members of the set.
3. The method of claim 2 wherein said similarity  
criterion comprises a threshold calculated using the  
complexes of said set and an average of the members  
25 of the set.
4. The method of claim 3 wherein said similarity  
criterion further comprises a predefined threshold  
value.  
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5. The method of any preceding claim wherein said step  
of calculating a representative complex is a step of  
calculating an average complex of the members of the  
subset.  
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6. The method of any preceding claim further comprising  
a step of analysing said heart beat signal to

identify and select genuine heart beat complexes to form said series.

- 5 7. The method of any preceding claim wherein said step of identifying comprises:  
aligning the complexes of said set;  
forming a set-average complex from said aligned complexes;  
10 comparing each complex of said set to said set-average complex;  
determining if each result of comparing satisfies said similarity criterion; and  
forming said subset from only those complexes of said set for which the similarity criterion is satisfied.  
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8. The method of claim 7 wherein said step of comparing comprises correlating each complex of said set with said set-average complex, and comparing each  
20 resulting correlation coefficient with a threshold value.
9. The method of claim 7 or 8 wherein said signal is an electrocardiogram signal and wherein said step of  
25 aligning the complexes of said set comprises the step of aligning said complexes on an R-top feature of each complex.
10. The method of any of claims 1 to 8 wherein said heart beat signal is an electrocardiogram signal.
- 30 11. Computer apparatus adapted to carry out the method steps of any of claims 1 to 10.
12. A computer readable medium carrying a computer  
35 program product comprising elements adapted to carry

out the method steps of any of claims 1 to 10.

13. Apparatus for analysing a heart beat signal which comprises a series of heart beat complexes,  
5 comprising:  
an extract set element (44) adapted to select a set of complexes from said series;  
a select subset element (46, 48, 50) adapted to identify from the set a subset of complexes each of  
10 which satisfy a similarity criterion with respect o members of the set; and  
a combiner element (52) adapted to calculate a representative complex from the members of the subset.  
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14. The apparatus of claim 13 further comprising an analysis element (54) adapted to establish one or more heart beat signal parameters from said representative complex.  
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15. The apparatus of claim 13 or 14 wherein the select subset element comprises:  
an align set element (46) adapted to align the complexes of said set; and  
25 a calculate criterion element (48) adapted to establish said similarity criterion from the aligned complexes.
16. The apparatus of claim 15 wherein the calculate criterion element (48) establishes said similarity criterion as a threshold calculated using the complexes of said set and an average of the members of the set.  
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17. The apparatus of any of claims 13 to 16 further  
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comprising a preprocess element (42) adapted to identify and select genuine heart beat complexes to form said series.

- 5 18. Apparatus for analysing a heart beat signal comprising a plurality of heart beat complexes, the apparatus comprising:  
an analysis engine adapted to automatically calculate a representative heart beat complex for each of a  
10 plurality of preselected intervals of said signal;  
and  
an editor adapted to enable a user to edit parameters relating to each automatically calculated representative heart beat complex.
- 15 19. The apparatus of claim 18 wherein each interval contains a set of heart beat complexes, the analysis engine is adapted to automatically decide which complexes in the set to include in each  
20 representative heart beat complex, and the editor is adapted to enable the user to subsequently change which complexes are included.
- 25 20. The apparatus of claim 19 wherein the editor is adapted to enable the user to select whether a particular complex should be included, not included, or included subject to a similarity criterion, in the corresponding representative heart beat complex.
- 30 21. The apparatus of any of claims 18 to 20 wherein the representative complex is an average of the included complexes.
- 35 22. The apparatus of any of claims 18 to 21 wherein the editor is further adapted to provide the user with a

graphical display of at least some of the heart beat complexes within a current one of the intervals of said signal and with a graphical display of the current representative heart beat complex for the interval.

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23. The apparatus of claim 22 wherein the editor is further adapted to display, on the display of the current representative heart beat complex, one or more feature markers indicating the automatically determined locations of one or more features of said representative heart beat complex.

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24. The apparatus of claim 23 wherein the editor is further adapted to enable the user to move said markers.

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25. The apparatus of any of claims 18 to 24 wherein the analysis engine is further adapted to calculate one or more heart beat parameters of each representative heart beat complex, and said editor is adapted to display said heart beat parameters and to update said display according to changes made by said user.

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25 26. A computer readable medium comprising a computer program product arranged to provide the apparatus of any of claims 18 to 25 when executed on a suitable computer system.